REMARKS

Claims 1-26 are pending and at issue. Each of these claims stand rejected as anticipated by *Mittal* (USPN 5,719,800). Although Applicants addressed *Mittal* in the previous response, the Examiner has maintained the rejection. Applicants appreciate the Examiner's review of the previous response, as well as the removal of the incorrect finality indication. Applicants, however, respectfully but strongly disagree with the continued rejection based on *Mittal*.

Mittal is directed to a system for managing power on an integrated circuit (IC) by measuring the activity level on an IC, for example, by measuring the number of clock cycles the IC is executing code versus the number of cycles that IC idle. The present application, in contrast, is directed to techniques capable of profiling the power usage and performance of code executing on a machine. Instead of seeking to determine whether the IC should be powered up or down, the present application allows a user to know the power profile of a code, to identify, for example, which portions of code require more processing power than other portions of code or which portions of code are causing the machine to stall and continue in the same state as quantums of power are being used on the machine.

It is this basic distinction between *Mittal* and the present application that underlies the rationale for why any rejection based on *Mittal*, whether taken alone or in combination, is improper.

PRIOR ART REJECTIONS

The applicants previously noted that while *Mittal* does describe techniques for managing power (throttling) in an IC device, there is no teaching of determining when a particular quantum of power has been used on the machine and responding to that measurement by sampling state data of the machine.

The office action responds on pages 5 and 6 that *Mittal* discloses "measuring power usage on the machine to effect throttling" at 3:4-50, where the power usage is measured based on voltage and frequency of the IC. This

information is used to throttle the power of the IC, as described at 5:13-67 and 2:65 – 3:50, per the office action.

What the office action does not identify, and does not address, is the fact that *Mittal* does not describe both measuring power usage and determining when a particular quantum of power has been used. There is nothing in *Mittal* for example that determines, during its power measurement, when the machine or particular subsystem has consumed a particular amount of power, e.g., 100 mW. Instead, as the Applicants previously described, *Mittal* seeks to measure activity level, i.e., whether the machine or a particular subsystem is active. If the system is active beyond a threshold amount, i.e., if a threshold activity level is met, then the machine can instruct the system to change the power level to the IC due to increased usage. In this way, the *Mittal* system triggers on an event, activity level.

In contrast, determining when a quantum of power has been used allows a machine to be more accurate in its power measurement. As noted in the present application, events can consume different amounts of power, therefore while they may be related to power, in a general, they may in fact not reflect the actual power usage or the machine. Furthermore, by measuring power usage and separately determining when a particular quantum of power has been measured, the machine may be able to provide power profiles for the system. For example, the machine may sample state data upon each usage (delivery and/or consumption) of 100 mW of power to determine whether the machine has changed states since the last time 100 mW of power had been measured, or to determine whether the machine is still executing within the same state. In this way, the machine, the subsystems of the machine, or the code executing on the machine may be analyzed to develop a power profile. In the case of code, that profile may indicate those portions, or "hot spots," of code that use more power than other portions of code, i.e., those portions which are active over greater numbers of quantums of power. With *Mittal* there is no such analysis, only an indication of whether code is actively executing or not. With the present application, the executing code may be analyzed specifically for its power performance.

Claim 1 has been amended above to recite an article comprising a machine-accessible medium having stored thereon instructions that, when executed by a machine, cause the machine to:

> measure power usage on the machine;
>
> determine when a plurality of a quantum of power has been used on the machine;
>
> in response to usage of the quantum of power on the machine, sample state data of the machine, where the state data indicates a state of code executing on the machine; and
>
> analyze performance of the code executing on the machine based on sampled state data.

As previously described, *Mittal* allows an IC to dynamically adjust between the tradeoffs of high-speed operation and low-power operation, by throttling back performance of functional units when their utilization exceeds a sustainable level. Abstract. And it is this utilization that *Mittal* measures and accesses to determine if power consumption should be throttled back.

Mittal, however, nowhere teaches or suggests determining each time a quantum of power has been used on a machine (e.g., each time a quantum has been used until a threshold or maximum number of quantums have been sampled) or sampling state data of the machine in response to usage of the quantum of power, as recited in claim 1. *Mittal* does not determine sample state data upon each usage of power, but instead determines whether an IC has been active for a certain number of clock cycles over a given period of time. Furthermore, *Mittal* nowhere teaches or suggests analyzing performance of code executing on the machine based on the sampled state data. *Mittal*, as the office action appears to recognize on page 5, uses its activity level information to throttle power.

Claim 1 has been amended to recite subject matter somewhat similar to that of claims 24-26, where these claims expressly recite profiling the power

usage of code executing on the machine, while claim 1 recites analyzing performance of code, which may including such profiling. In rejecting these claims 24-26, it appears that the office action is misapplying the language of the claims, with respect to the term "code". Claims 24-26 use the term "profile power usage of code" executing on the machine, while the office action cites to *Mittal* as teaching "power usage code." The Applicants do not refute that *Mittal* teaches code that executes on its machine to determine when to throttle power. But that "power usage code" does not teach profiling power usage of code executing on the machine. There is no indication that *Mittal* analyses the code executing on it to determine how much power that code is using. Instead, *Mittal* is concerned with measuring activity level irrespective of the code that is causing the activity.

In short, *Mittal* does not teach, suggest, or motivate the recited subject matter. Claim 1 and claims 2-9 and 24-26 depending therefrom are in condition for allowance.

Claim 10 as amended similar to that of claim 1 and now recites a method of profiling code executable on a machine, the method comprising:

> measuring power usage on the machine;
>
> determining when a plurality of a quantum of power has been used on the machine;
>
> in response to usage of the quantum of power on the machine, sampling state data on the machine, where the state data indicates a state of code executing on the machine; and
>
> analyzing performance of the code executing on the machine based on sampled state data.

Therefore, for the reasons outlined above with respect to claim 1, claim 10 and claims 11-19 depending therefrom are in condition for allowance.

Apparatus claim 20 has been amended to recite a performance analysis module capable of providing an analysis of code in response to sampled state data. Specifically, claim 20 now recites an apparatus comprising:

> a power measurement module capable of measuring power usage in the apparatus and capable of determining when a quantum of power has been used; and
>
> a power sampling module coupled to the power measurement module for sampling state data of the apparatus after each of a plurality of quantums of power has been used; and
>
> a power analysis module that analyzes code executing on the apparatus in response to the sampling of the state data to develop a power profile of the code.

Therefore, for similar reasons to those outlined above, claim 20 and claims 21-23 depending therefrom are in condition for allowance.

In view of the above, Applicants respectfully submit that this application is in condition for immediate allowance.

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Respectfully submitted,

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